

176\_61623\_Sequence\_List\_ST25.txt  
SEQUENCE LISTING

<110> Maines, Mahin D.  
<120> METHODS OF MODULATING CELL CYCLE AND CELL SIGNALING PATHWAYS  
USING BILIVERDIN REDUCTASE  
<130> 176/61623 (1208)  
<140> 10/584,886  
<141> 2006-08-28  
<150> PCT/US2004/031866  
<151> 2004-09-29  
<150> 60/539,006  
<151> 2004-01-23  
<150> 60/506,805  
<151> 2003-09-29  
<160> 18  
<170> PatentIn version 3.5  
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<211> 296  
<212> PRT  
<213> Homo sapiens  
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1 5 10 15  
Gly Arg Ala Gly Ser Val Arg Met Arg Asp Leu Arg Asn Pro His Pro  
20 25 30  
Ser Ser Ala Phe Leu Asn Leu Ile Gly Phe Val Ser Arg Arg Glu Leu  
35 40 45  
Gly Ser Ile Asp Gly Val Gln Gln Ile Ser Leu Glu Asp Ala Leu Ser  
50 55 60  
Ser Gln Glu Val Glu Val Ala Tyr Ile Cys Ser Glu Ser Ser Ser His  
65 70 75 80  
Glu Asp Tyr Ile Arg Gln Phe Leu Asn Ala Gly Lys His Val Leu Val  
85 90 95  
Glu Tyr Pro Met Thr Leu Ser Leu Ala Ala Ala Gln Glu Leu Trp Glu  
100 105 110  
Leu Ala Glu Gln Lys Gly Lys Val Leu His Glu Glu His Val Glu Leu  
115 120 125

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Leu Met Glu Glu Phe Ala Phe Leu Lys Lys Glu Val Val Gly Lys Asp  
130 135 140

Leu Leu Lys Gly Ser Leu Leu Phe Thr Ser Asp Pro Leu Glu Glu Asp  
145 150 155 160

Arg Phe Gly Phe Pro Ala Phe Ser Gly Ile Ser Arg Leu Thr Trp Leu  
165 170 175

Val Ser Leu Phe Gly Glu Leu Ser Leu Val Ser Ala Thr Leu Glu Glu  
180 185 190

Arg Lys Glu Asp Gln Tyr Met Lys Met Thr Val Cys Leu Glu Thr Glu  
195 200 205

Lys Lys Ser Pro Leu Ser Trp Ile Glu Glu Lys Gly Pro Gly Leu Lys  
210 215 220

Arg Asn Arg Tyr Leu Ser Phe His Phe Lys Ser Gly Ser Leu Glu Asn  
225 230 235 240

Val Pro Asn Val Gly Val Asn Lys Asn Ile Phe Leu Lys Asp Gln Asn  
245 250 255

Ile Phe Val Gln Lys Leu Leu Gly Gln Phe Ser Glu Lys Glu Leu Ala  
260 265 270

Ala Glu Lys Lys Arg Ile Leu His Cys Leu Gly Leu Ala Glu Glu Ile  
275 280 285

Gln Lys Tyr Cys Cys Ser Arg Lys  
290 295

<210> 2  
<211> 1070  
<212> DNA  
<213> Homo sapiens

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atgaatgcag agcccgagag gaagtttggc gtggtggtgg ttggtgttgg ccgagccggc 120  
tccgtgcgga tgagggactt gcggaatcca cacccttctt cagcgttctt gaacctgatt 180  
ggcttcgtgt cgagaaggga gctcgggagc attgatggag tccagcagat ttctttggag 240  
gatgctcttt ccagccaaga ggtggaggtc gcctatatct gcagtgcagag ctccagccat 300  
gaggactaca tcaggcagtt ccttaatgct ggcaagcacg tccttgtgga ataccatg 360

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gtggggaaa	acctgctgaa	agggtcgctc	ctcttcacat	ctgaccctgt	ggaagaagac	540
cggtttggct	tcctgtcatt	cagcggcatc	tctcgactga	cctggctggt	ctccctcttt	600
ggggagcttt	ctcttgtgtc	tgccactttg	gaagagcgaa	aggaaatca	gtatatgaa	660
atgacagtgt	gtctggagac	agagaagaaa	agtccactgt	catggattga	agaaaaagga	720
cctggctcaa	aacgaacag	atatttaagc	ttccatttca	agctctgggtc	cttggagaat	780
gtgccaaatg	taggagtga	taagaacata	tttctgaaag	atcaaaatat	atttgtccag	840
aaactcttgg	gccagtcttc	tgagaaggaa	ctggctgctg	aaaagaaacg	catcctgcac	900
tgcttggggc	ttgcagaaga	aatccagaaa	tattgtctgt	caaggaaagta	agaggaggag	960
gtgatgtagc	acttccaaga	tggcaccagc	atttggttct	tctcaagagt	tgaccattat	1020
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<210> 3  
 <211> 296  
 <212> PRT  
 <213> Homo sapiens

<400> 3

Met Asn Thr Glu Pro Glu Arg Lys Phe Gly Val Val Val Val Gly Val  
 1 5 10 15

Gly Arg Ala Gly Ser Val Arg Met Arg Asp Leu Arg Asn Pro His Pro  
 20 25 30

Ser Ser Ala Phe Leu Asn Leu Ile Gly Phe Val Ser Arg Arg Glu Leu  
 35 40 45

Gly Ser Ile Asp Gly Val Gln Gln Ile Ser Leu Glu Asp Ala Leu Ser  
 50 55 60

Ser Gln Glu Val Glu Val Ala Tyr Ile Cys Ser Glu Ser Ser Ser His  
 65 70 75 80

Glu Asp Tyr Ile Arg Gln Phe Leu Asn Ala Gly Lys His Val Leu Val  
 85 90 95

Glu Tyr Pro Met Thr Leu Ser Leu Ala Ala Ala Gln Glu Leu Trp Glu  
 100 105 110

Leu Ala Glu Gln Lys Gly Lys Val Leu His Glu Glu His Val Glu Leu  
 115 120 125

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Leu Met Glu Glu Phe Ala Phe Leu Lys Lys Glu Val Val Gly Lys Asp  
130 135 140

Leu Leu Lys Gly Ser Leu Leu Phe Thr Ala Gly Pro Leu Glu Glu Glu  
145 150 155 160

Arg Phe Gly Phe Pro Ala Phe Ser Gly Ile Ser Arg Leu Thr Trp Leu  
165 170 175

Val Ser Leu Phe Gly Glu Leu Ser Leu Val Ser Ala Thr Leu Glu Glu  
180 185 190

Arg Lys Glu Asp Gln Tyr Met Lys Met Thr Val Cys Leu Glu Thr Glu  
195 200 205

Lys Lys Ser Pro Leu Ser Trp Ile Glu Glu Lys Gly Pro Gly Leu Lys  
210 215 220

Arg Asn Arg Tyr Leu Ser Phe His Phe Lys Ser Gly Ser Leu Glu Asn  
225 230 235 240

Val Pro Asn Val Gly Val Asn Lys Asn Ile Phe Leu Lys Asp Gln Asn  
245 250 255

Ile Phe Val Gln Lys Leu Leu Gly Gln Phe Ser Glu Lys Glu Leu Ala  
260 265 270

Ala Glu Lys Lys Arg Ile Leu His Cys Leu Gly Leu Ala Glu Glu Ile  
275 280 285

Gln Lys Tyr Cys Cys Ser Arg Lys  
290 295

<210> 4  
<211> 295  
<212> PRT  
<213> Rattus norvegicus

<400> 4

Met Asp Ala Glu Pro Lys Arg Lys Phe Gly Val Val Val Val Gly Val  
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Gly Arg Ala Gly Ser Val Arg Leu Arg Asp Leu Lys Asp Pro Arg Ser  
20 25 30

Ala Ala Phe Leu Asn Leu Ile Gly Phe Val Ser Arg Arg Glu Leu Gly  
35 40 45

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Ser Leu Asp Glu Val Arg Gln Ile Ser Leu Glu Asp Ala Leu Arg Ser  
50 55 60

Gln Glu Ile Asp Val Ala Tyr Ile Cys Ser Glu Ser Ser Ser His Glu  
65 70 75 80

Asp Tyr Ile Arg Gln Phe Leu Gln Ala Gly Lys His Val Leu Val Glu  
85 90 95

Tyr Pro Met Thr Leu Ser Phe Ala Ala Ala Gln Glu Leu Trp Glu Leu  
100 105 110

Ala Ala Gln Lys Gly Arg Val Leu His Glu Glu His Val Glu Leu Leu  
115 120 125

Met Glu Glu Phe Glu Phe Leu Arg Arg Glu Val Leu Gly Lys Glu Leu  
130 135 140

Leu Lys Gly Ser Leu Arg Phe Thr Ala Ser Pro Leu Glu Glu Glu Arg  
145 150 155 160

Phe Gly Phe Pro Ala Phe Ser Gly Ile Ser Arg Leu Thr Trp Leu Val  
165 170 175

Ser Leu Phe Gly Glu Leu Ser Leu Ile Ser Ala Thr Leu Glu Glu Arg  
180 185 190

Lys Glu Asp Gln Tyr Met Lys Met Thr Val Gln Leu Glu Thr Gln Asn  
195 200 205

Lys Gly Leu Leu Ser Trp Ile Glu Glu Lys Gly Pro Gly Leu Lys Arg  
210 215 220

Asn Arg Tyr Val Asn Phe Gln Phe Thr Ser Gly Ser Leu Glu Glu Val  
225 230 235 240

Pro Ser Val Gly Val Asn Lys Asn Ile Phe Leu Lys Asp Gln Asp Ile  
245 250 255

Phe Val Gln Lys Leu Leu Asp Gln Val Ser Ala Glu Asp Leu Ala Ala  
260 265 270

Glu Lys Lys Arg Ile Met His Cys Leu Gly Leu Ala Ser Asp Ile Gln  
275 280 285

Lys Leu Cys His Gln Lys Lys  
290 295

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<210> 5
<211> 1081
<212> DNA
<213> Rattus norvegicus

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gaaatttgga gtggtagtgg ttggtgttgg cagagctggc tcggtgaggc tgagggactt      180
gaaggatcca cgctctgcag cattcctgaa cctgattgga tttgtgtcca gacgagagct      240
tgggagcctt gatgaagtac ggcagatttc tttggaagat gctctccgaa gccaaagagat      300
tgatgtcgcc tatattgca gtgagagtgc cagccatgaa gactatatac ggcagtttct      360
gcaggctggc aagcatgtcc tcgtggaata ccccatgaca ctgtcatttg cgcgggccca      420
ggagctgtgg gagctggcgg cacagaaagg gagagtcctg catgaggagc acgtggaact      480
cttgatggag gaattcgaat tcctgagaag agaagtgttg gggaaagagc tactgaaagg      540
gtctcttcgc ttcacagcta gccactgga agaagagaga tttggcttcc ctgcgttcag      600
cggcatttct cgctgacct ggctggtctc cctcttcggg gagcttctct ttaattctgc      660
caccttgga gagcgaaaag aggatcagta tatgaaaatg accgtgcagc tggagacca      720
gaacaagggt ctgctgtcat ggattgaaga gaaagggcct ggcttaaaaa gaaacagata      780
tgtaaaactc cagttcactt ctgggtccct ggaggaagtg ccaagtgtag ggggtcaataa      840
gaacattttc ctgaaagatc aggatatatt tgttcagaag ctcttagacc aggtctctgc      900
agaggacctg gctgctgaga agaagcgcat catgcattgc ctggggctgg ccagcgacat      960
ccagaagctt tgccaccaga agaagtgaag aggaagcttc agagacttct gaagggggcc      1020
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<210> 6
<211> 295
<212> PRT
<213> Mus musculus

<400> 6
Met Ser Thr Glu Pro Lys Arg Lys Phe Gly Val Val Val Val Gly Val
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Gly Arg Ala Gly Ser Val Arg Ile Arg Asp Ser Lys Asp Pro His Ser
20          25          30

Ser Ala Phe Leu Asn Leu Ile Gly Tyr Val Ser Arg Arg Glu Leu Gly

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40

45

Ser Leu Asp Asn Val Arg Gln Ile Ser Leu Glu Asp Ala Leu Arg Ser  
 50 55 60  
 Gln Glu Val Asp Val Ala Tyr Ile Cys Thr Glu Ser Ser Ser His Glu  
 65 70 75  
 Asp Tyr Ile Arg Gln Phe Leu Gln Ala Gly Lys His Val Leu Val Glu  
 85 90 95  
 Tyr Pro Met Ala Leu Ser Phe Ala Ala Ala Gln Glu Leu Trp Glu Leu  
 100 105 110  
 Ala Ala Gln Lys Gly Arg Val Leu His Glu Glu His Ile Glu Leu Leu  
 115 120 125  
 Met Glu Glu Phe Glu Phe Leu Lys Arg Glu Val Ala Gly Lys Glu Leu  
 130 135 140  
 Leu Lys Gly Ser Leu Arg Phe Thr Ala Ser Pro Leu Glu Glu Glu Lys  
 145 150 155 160  
 Phe Gly Phe Pro Ala Phe Ser Gly Ile Ser Arg Leu Thr Trp Leu Val  
 165 170 175  
 Ser Leu Phe Gly Glu Leu Ser Leu Ile Ser Ala Thr Met Glu Asn Arg  
 180 185 190  
 Lys Glu Asp Gln Tyr Met Lys Met Thr Val Gln Leu Glu Thr Gln Asn  
 195 200 205  
 Lys Ser Pro Leu Ser Trp Ile Glu Glu Lys Gly Pro Gly Leu Lys Arg  
 210 215 220  
 Asn Arg His Ile Ser Ile His Phe Lys Ser Gly Ser Leu Glu Glu Val  
 225 230 235 240  
 Pro Asn Val Gly Val Asn Lys Asn Ile Phe Leu Lys Asp Gln Asp Ile  
 245 250 255  
 Phe Ile Gln Lys Leu Leu Gly Gln Val Ser Ala Glu Asp Leu Ala Ala  
 260 265 270  
 Glu Lys Lys Arg Ile Leu His Cys Leu Glu Leu Ala Ser Asp Ile Gln  
 275 280 285

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Arg Leu Cys His Arg Lys Gln  
290 295

<210> 7  
<211> 296  
<212> PRT  
<213> Sus scrofa

<400> 7

Met Asn Ala Glu Pro Glu Arg Lys Phe Gly Val Val Val Val Gly Val  
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20 25 30

Ser Ser Ala Phe Leu Asn Leu Ile Gly Phe Val Ser Arg Glu Leu  
35 40 45

Gly Ser Ile Asp Gly Val Gln Gln Ile Ser Leu Glu Asp Ala Leu Ser  
50 55 60

Ser Gln Glu Val Glu Val Ala Tyr Ile Cys Ser Glu Ser Ser Ser His  
65 70 75 80

Glu Asp Tyr Ile Arg Gln Phe Leu Asn Ala Gly Lys His Val Leu Val  
85 90 95

Glu Tyr Pro Met Thr Leu Ser Leu Ala Ala Ala Gln Glu Leu Trp Glu  
100 105 110

Leu Ala Glu Gln Lys Gly Lys Val Leu His Glu Glu His Val Glu Leu  
115 120 125

Leu Met Glu Glu Phe Ala Phe Leu Lys Lys Glu Val Val Gly Lys Asp  
130 135 140

Leu Leu Lys Gly Ser Leu Leu Phe Thr Ala Gly Pro Leu Glu Glu Glu  
145 150 155 160

Arg Phe Gly Ser Pro Ala Phe Ser Gly Ile Ser Arg Leu Thr Trp Leu  
165 170 175

Val Ser Leu Phe Gly Glu Leu Ser Leu Val Ser Ala Thr Leu Glu Glu  
180 185 190

Arg Lys Glu Asp Gln Tyr Met Lys Met Thr Val Cys Leu Glu Thr Glu  
195 200 205



176\_61623\_Sequence\_List\_ST25.txt

Lys Lys Ser Pro Leu Ser Trp Ile Glu Glu Lys Gly Pro Gly Leu Lys  
210 215 220

Arg Asn Arg Tyr Leu Ser Phe His Phe Lys Ser Gly Ser Leu Glu Asn  
225 230 235 240

Val Pro Asn Val Gly Val Asn Lys Asn Ile Phe Leu Lys Asp Gln Asn  
245 250 255

Ile Phe Val Gln Lys Leu Leu Gly Gln Phe Ser Glu Lys Glu Leu Ala  
260 265 270

Ala Glu Lys Lys Arg Ile Leu His Cys Leu Gly Leu Ala Glu Glu Ile  
275 280 285

Gln Lys Tyr Cys Cys Ser Arg Lys  
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<212> RNA  
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<211> 21  
<212> RNA  
<213> Artificial

<220>  
<223> siRNA for Biliverdin reductase

<400> 9  
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<211> 68  
<212> DNA  
<213> Artificial

<220>  
<223> Primer 724BVR

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gtttggcg 68

<210> 11

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<211> 48
<212> DNA
<213> Artificial

<220>
<223> Primer 725BVR

<400> 11
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<210> 12
<211> 8
<212> PRT
<213> Artificial

<220>
<223> FLAG polypeptide

<400> 12
Asp Tyr Lys Asp Asp Asp Lys
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<210> 13
<211> 27
<212> DNA
<213> Artificial

<220>
<223> Oligonucleotide 1x CRE

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<212> DNA
<213> Artificial

<220>
<223> Oligonucleotide 4x CRE

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<210> 15
<211> 27
<212> DNA
<213> Artificial

<220>
<223> Oligonucleotide 1x mut CRE

<400> 15
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<212> DNA
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<220>
<223> oligonucleotide

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<211> 68
<212> DNA
<213> Artificial

<220>
<223> oligonucleotide encoding siRNA

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tttgaaa                                           68

<210> 18
<211> 68
<212> DNA
<213> Artificial

<220>
<223> oligonucleotide encoding siRNA

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gaggaggg                                           68

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